

IN THE CLAIMS

1. (Previously presented) A method of manufacturing an MIM capacitor comprising:

forming a dielectric layer on the surface of a substrate on which a lower electrode and a first wiring layer are formed;

patterning the dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed, wherein patterning the dielectric layer comprises:

forming a dual hard mask (DHM) on the dielectric layer; and

etching the dielectric layer using the DHM as an etching mask; and

forming an upper electrode to contact the first wiring layer through the contact hole,

wherein forming the DHM on the dielectric layer comprises:

forming on the dielectric layer a DHM lower layer comprising the same material that is used to form the upper electrode; and

forming a DHM upper layer of a dielectric material on the DHM lower layer.

2-3. (Cancelled)

4. (Previously presented) The method of claim 1, wherein the DHM upper layer and the dielectric layer are formed of the same material to the same thickness.

5. (Previously presented) The method of claim 1, further comprising substantially etching away the DHM upper mask at the same time as etching the dielectric layer.

6. (Original) The method of claim 5, wherein forming the upper electrode comprises:

forming a conductive layer on the DHM lower mask and within contact hole; and

patterning the conductive layer and the DHM lower mask.

7. (Previously presented) The method of claim 1, wherein forming the DHM on the dielectric layer comprises:

forming a dielectric DHM lower layer on the dielectric layer, the DHM lower layer having an etch selectivity relative to the dielectric layer;
forming a dielectric DHM upper layer on the DHM lower layer;
forming a photoresist pattern that defines the contact hole on the DHM upper layer;
etching the DHM lower and upper layers using the photoresist pattern as an etching mask; and
removing the photoresist pattern.

8. (Original) The method of claim 7, wherein the DHM upper layer and the dielectric layer are formed of the same material to the same thickness.

9. (Original) The method of claim 7, wherein etching the dielectric layer using the DHM as an etching mask comprises:

substantially etching away the DHM upper mask at the same time as etching the dielectric layer; and
removing the DHM lower mask to expose a surface of the dielectric layer.

10. (Original) The method of claim 9, wherein forming the upper electrode comprises:

forming a conductive layer on the dielectric layer and within the contact hole; and
patterning the conductive layer to complete the upper electrode.

11-22. (Cancelled)

23. (Previously presented) A method of manufacturing an MIM capacitor, which includes a lower electrode and a first wiring layer having a top surface that is located at or below a bottom surface of the lower electrode and is insulated from the lower electrode, the method comprising:

forming a dielectric layer on the surface of a substrate on which the lower electrode and the first wiring layer are formed;

patterning the dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

forming an upper electrode, wherein the upper electrode overlaps the lower electrode and is within the contact hole.

24. (Previously presented) A method of manufacturing an MIM capacitor, which includes a lower electrode located above an interlayer dielectric layer and a first wiring layer that is disposed in the interlayer dielectric layer and that is below, and insulated from, the lower electrode, the method comprising:

forming a non-planar dielectric layer on the surface of a substrate on which the lower electrode and the first wiring layer are formed so that the non-planar dielectric layer includes steps to cross up and over the lower electrode;

patterning the non-planar dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

forming an upper electrode, wherein the upper electrode overlaps the lower electrode and is within the contact hole.

25. (Previously presented) A method of manufacturing an MIM capacitor, which includes a lower electrode and a first wiring layer that is located below or in a same level with the lower electrode and is insulated from the lower electrode, the method comprising:

forming a dielectric layer on the surface of a substrate on which the lower electrode and the first wiring layer are formed;

patterning the dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

after patterning the dielectric layer, forming an upper electrode, wherein the upper electrode contacts the first wiring layer through a contact hole.

26. (Previously presented) The method of claim 25, wherein the upper electrode contacts both the first wiring layer through the contact hole and a top surface of the dielectric layer.

27. (Previously presented) A method of manufacturing an MIM capacitor comprising:

forming a dielectric layer on the surface of a substrate on which a lower electrode and a first wiring layer are formed;

 patterning the dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

 after patterning the dielectric layer, forming an upper electrode, wherein the upper electrode contacts the first wiring layer through a contact hole.

28. (Previously presented) The method of claim 27, wherein the upper electrode comprises a single conductive layer.

29. (Previously presented) The method of claim 27, wherein the first wiring layer is insulated from the lower electrode.

30. (Previously presented) A method of manufacturing an MIM capacitor comprising:

forming a dielectric layer on the surface of a substrate on which a lower electrode and a first wiring layer are formed;

 patterning the dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

 forming an upper electrode, wherein the upper electrode overlaps the lower electrode and is within the contact hole.

31. (Previously presented) The method of claim 30, wherein the first wiring layer is insulated from the lower electrode.

32. (Previously presented) A method of manufacturing an MIM capacitor comprising:

forming a non-planar dielectric layer on the surface of a substrate on which a lower electrode and a first wiring layer are formed so that the non-planar dielectric layer includes steps to cross up and over the lower electrode;

patterning the non-planar dielectric layer to form a contact hole through which the surface of the first wiring layer is exposed; and

forming an upper electrode, wherein the upper electrode overlaps the lower electrode and is within the contact hole.

33. (Previously presented) The method of claim 32, wherein the first wiring layer is insulated from the lower electrode.

34. (Previously presented) The method of claim 1, wherein forming the DHM on the dielectric layer further comprises:

forming a photoresist pattern that defines the contact hole on the DHM upper layer; etching the DHM upper and lower layers using the photoresist pattern as an etching mask; and

removing the photoresist pattern.

35. (Previously presented) The method of claim 1, wherein the first wiring layer is insulated from the lower electrode.